

**ABSTRACT OF THE DISCLOSURE**

A method for assigning a predetermined wavelength between two different nodes in a wavelength division multiplexing ring communication network that has an N number of nodes and at least one pair of optical fibers sequentially connecting the N number of nodes is disclosed. A matrix is formed to represent optical-path configuration and wavelength assignment for an N-1 number of nodes. The matrix is extended by adding a column at any position of the matrix. Then X is assigned to the added column. An N/2 number of rows is added in the matrix. Tracking along each row toward the left, from the added column, a firstly encountered numeral is selected, and then the selected numeral is increased by one.

10 Numerals 1, 2... N/2 are assigned sequentially to locations corresponding to the added column in the added rows, and X is assigned to locations next to the numeral-assigned locations, where the number of X-assigned locations is equal to a hop-number corresponding to the assigned numeral. Tracking along each of the added rows toward the right, an empty location is found and the found empty location is assigned a numeral not

15 used in the same column as the empty location, among the numerals 1, 2... N/2. Then, X is assigned to locations next to the empty location, where the number of X-assigned locations is equal to a hop-number corresponding to the assigned numeral minus 1. N is an even number. X represents that an optical path of the corresponding node is not formed.